Jeanroy; French Literature of the Middle Ages, by Alfred Jeanroy; Modern French Literature, by Gustave Lanson; Italian, by Henri Hauvette; Spanish, by Ernest Martinenche; English, by Émile Legouis; German, by Charles Andler; Juridical and Political Science, by F. Larnaude; Economics, by Charles Gide.

Each chapter is followed by a well-chosen bibliography of the great French works within its field, and the work is embellished by portrait illustrations, Pasteur having been selected for the frontispiece of Volume I., and Renan for Volume II. The press work, while without any luxurious quality, is dignified and in the best French taste.

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## SCIENTIFIC JOURNALS AND ARTICLES

The December number (Vol. 22, No. 3) of *The Bulletin of the American Mathematical Society* contains: "Concerning absolutely continuous functions," by M. B. Porter; "On the representation of numbers in the form $x^3+y^3+z^3-3xyz$," by R. D. Carmichael; "On the linear continuum," by R. L. Moore; "A problem in the kinematics of a rigid body," by Peter Field; "Jules Henri Poincaré" (review of Enquête de "l'Enseignement Mathématique" sur la Méthode de Travail des Mathématiciens, second edition, and Lebon's Notice sur Henri Poincaré and Savants du Jour: Henri Poincaré, second edition), by R. C. Archibald; "Shorter Notices"; Breslich's First-Year Mathematics for Secondary Schools, by D. E. Smith; Braude's Coordonnées intrinsèques, by R. C. Archibald; Châtelet's Leçons sur la Théorie des Nombres, by E. B. Skinner; Salmon's Treatise on the Analytic Geometry of Three Dimensions, fifth edition, volume 2, by Virgil Snyder; Hermann Grassmann's gesammelte mathematische und physikalische Werke, Band 3, by E. B. Wilson; "Notes;" and "New Publications."

The January number (Vol. 22, No. 4) of the *Bulletin* contains: Report of the October meeting of the society, by F. N. Cole; Report of the twenty-seventh regular meeting of the San Francisco Section, by Thomas Buck; "Transformation theorems in the theory of the linear vector function," by V. C. Poor; Review of Hobson's John Napier and the Invention of Logarithms, 1614, and Gibson's Napier and the Invention of Logarithms, by R. C. Archibald; Review of Moritz's Memorabilia Mathematica, by R. C. Archibald; "Shorter Notices"; Hill's Development of Arabic Numerals in Europe, by D. E. Smith; Caunt's Introduction to the Infinitesimal Calculus, by T. E. Mason; Lenz's Die Rechenmaschinen und das Maschinenrechnen and Furtwängler and Ruhm's Mathematische Ausbildung der deutschen Landmesser, by E. W. Ponzer; Dickson's Algebraic Invariants, Borel's Leçons sur la Théorie des Fonctions, second edition, Bateman's Mathematical Analysis of Electrical and Optical Wave-Motion on the Basis of Maxwell's Equations, and Rutherford's Radioactive Substances and their Radiations, by R. D. Carmichael; "Notes"; and "New Publications."

## SPECIAL ARTICLES

### THE POISONOUS EFFECTS OF THE ROSE CHAFER UPON CHICKENS

Serious losses have occurred each year during June and early July, from chickens having eaten the rose chafers (*Macrodatylus subspinosus*). These losses have often been ascribed to various causes, but close observations have shown that the chickens are very fond of eating these insects in large numbers, and post-mortem examinations have revealed the presence of many undigested insects in their crops. The crops are usually so full as to give the impression that death had been due to a "crop bound" condition of the chickens. Some have also supposed that these deaths were due to a mechanical injury of the crop by the spines on the legs of the insects having punctured the lining of this part of the digestive system, while others have accounted for the death of these chickens by the rose chafers having bitten the crops.

A number of cases, some of which resulted

in the loss of several hundred chickens, were reported to the writer and experiments in feeding rose chafers to chickens were taken up at the Storrs Agricultural Experiment Station in 1909.

The deaths from this diet usually occurred in from nine to twenty-four hours after feeding. This led the writer to believe that undoubtedly death resulted from a cause other than a mechanical injury to the crop or "crop bound" condition. An extract was made from crushed rose chafers and distilled water, filtered, and fed to chickens in varying doses with a medicine dropper and this resulted in a great many deaths. Small chickens died in a few hours after feeding, older chickens of heavier weight when fed a small quantity of the extract lived but showed signs of poisoning; large doses resulted in their deaths. Mature hens did not die from the extract.

From 150 to 200 chickens have been fed either with the rose chafers or with varying strengths of the extract to determine the weight of the chicken killed by a certain amount of poison, also to determine the age limit of the chickens killed.

The results may be summarized as follows: 15 to 20 rose chafers are sufficient to cause the death of a chicken one week old. From 25 to 45 rose chafers are usually necessary to kill a three-weeks-old chicken. While some nine-weeks-old chickens have been killed by eating rose chafers, only one ten-weeks-old chicken was killed in these experiments. In the crop of this chicken there were 96 undigested rose chafers counted in post-mortem examinations.

The chickens feed upon the insects ravenously, being attracted by their sprawly appearance and usually within an hour after eating they assume a dozing attitude, later leg weakness shows and the chicken usually dies within twenty-four hours of having eaten these insects, or begins to improve after this time.

In less than five per cent. of the deaths convulsions occurred. Post-mortem examinations showed no abnormal condition of the organs. In order to exclude the possibility of arsenical poisoning due to the rose chafers having fed upon leaves that have been sprayed, tests were made by a chemist for arsenic, but no evidence of arsenic was found.

Intravenous injections were made in these experiments, extracts for injection being made from forty grams of rose chafers and sixty c.c. of a salt solution having a specific gravity of .9 per cent. This extract was put in a centrifuge for five minutes, the extract drawn off in a pipette and filtered in vacuo. Three c.c. of this extract were injected into a 690-gram rabbit intravenously and this died in six minutes. Another rabbit, weighing 1.435 grams, died in three and one quarter minutes after an injection of four c.c. A small 610-gram rabbit, when injected with two and one half c.c., died in fifty-five seconds after injection, and a large 1,450-gram rabbit died in two hours and thirty-five minutes after being injected with two c.c. Other rabbits were injected and killed by this extract, but further work needs to be done to determine what is a lethal dose for rabbits and experiments in feeding rabbits per os will be taken up next summer.

As nearly as the writer can determine, the rose chafers contain a neuro toxin that has an effect upon the heart action of both chickens and rabbits and is excessively dangerous as a food for chickens.

Owing to the fact that the insect feeds upon such a large number of plants, particularly on daisies, it seems essential that chickens be kept in mowed fields and away from yards having grape vines and any flowering shrubs during the month when the rose chafers are about, especially during years when rose chafers are particularly abundant.

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## THE AMERICAN SOCIETY OF ZOOLOGISTS

THE American Society of Zoologists held its thirteenth annual meeting jointly with Section F and in affiliation with the American Society of Naturalists, December 28, 29 and 30, 1915, in Townshend Hall, Ohio State University, Columbus, Ohio.